

## NOTES ON THE MASON-WASP AND ITS NEST

By JANET W. RAFF, M.Sc., F.R.E.S.

The large mason-wasp, *Abispa ephippium* Fabr., is one of our most beautiful forms of mud-daubers. It is a solitary wasp belonging to the family known as Eumenidae, the members of which work in pairs only, there being no "worker" caste. In some species of the family the petiole or "waist" of the adult is short and inconspicuous as in this species, and so the body appears thick-set and robust: in others the petiole is long and narrow, giving the abdomen, or gaster, a stalked appearance.

*Abispa ephippium* measures over an inch in length, and about  $1\frac{1}{2}$  inch across the wings. It is light brown in colour, banded with black. The wings are light yellowish with dark tips, the fore-wings being folded lengthwise, when at rest, as is typical of the family (see photograph). The male has a yellow "face," while that of the female is light brown. Identification of the wasp has been verified by Mr. J. Clark, Entomologist of the National Museum, Melbourne.

The nest is shown in the accompanying photograph taken by Mr. A. O'Brien, to whom my thanks are due. It was brought to me in January, 1932, by Mrs. H. G. Andrewartha, who had collected it near Narrandera, N.S.W. It had been built under the eaves of a building, and measured roughly  $2 \times 2 \times 1\frac{1}{2}$  inches. It was placed in a breeding cage in the Insectarium at the School of Agriculture, University of Melbourne, and was held in a warm situation to await emergences, a humid atmosphere being maintained by keeping damp sawdust in the cage. The nest was composed of three chambers or cells and carried a beautifully constructed thin-walled funnel, directed downwards from the front chamber. Unfortunately, the lip of the funnel was slightly broken before the photograph was taken. The clay texture of the nest was very fine and hard and consolidated, and parts of the outside surface had a "rough-cast" appearance.

As no emergences occurred during that summer, towards the end of November the surface of two of the chambers was carefully pared down with a scalpel in order to see what was happening within. Sufficient material was removed to reveal the presence of a large soft cream-coloured larva in both of the chambers. The gaps made were immediately sealed over with gummed paper, and the nest was replaced in the breeding cage.

On March 2, 1933, an adult *Abispa ephippium* (female) emerged from one of these chambers, and a scraping noise was detected from the adjacent cell. Seven days later a male adult emerged from this cell.

These two cells were then opened still further, as seen in the photograph, for the purpose of examining the contents. Frag-

mentary remains of lepidopterous caterpillars were found, these having been stored as food for the developing wasps. Each cell was lined by the thin, papery light-yellow cocoon of the wasp.

A year later, as no further emergences had occurred, the third chamber was cut open for inspection. It was found to communicate directly with the funnel, and appeared at first sight to be empty, there being no caterpillars stored. On closer investigation, however, a minute object was located on the floor of the cell, and after a detailed examination this proved to be a broken egg-shell with a transparent larva protruding from the break. At the tapering end of the eggshell, there was a short stalk or filament. This minute object was probably the hatched egg of the *Abispa*, and reference to it will be made later.

Regarding the funnel structure, some interesting notes have been made by Mr. K. C. McKeown in the *Australian Museum Magazine* for 1932 (Vol. 4, p. 381). He explains that this is made by the female wasp as an entrance tube to the particular chamber under construction. He states that when the cell is completed and is provisioned with caterpillars the wasp lays an egg and then proceeds to plug the cell; this she does by breaking down the funnel and using the "masonry" with which to close the cell. Further, as each new cell is formed, another funnel is constructed, only to be pulled down later in the same way. That such a "thing of beauty" should be so destroyed does indeed seem to be a waste of energy.

This destruction of the funnel at the completion of building will account for the large massive nests of *Abispa*, composed of six to eight cells, so frequently found, which possesses no such entrance tube.

Mr. McKeown notes that the female was seen to rest in the empty cell at night, backing carefully in through the funnel-entrance.

Referring to the points noted above, that the third chamber of the nest, when examined, was found to be open to the exterior through the medium of the funnel entrance, and that it contained what was apparently a wasp egg but *no* store of caterpillars, an interesting question is opened up.

This finding gives support to the statement made by Wheeler and others that some of the Eumenid wasps, instead of first storing their nests with caterpillars and then laying an egg, after which the cell is closed, reverse this usual procedure, and lay an egg first, and keep the cell open while provisions are brought in to the developing wasp larva. The first method is the general one for *solitary* wasps and is the method usually stated for *Abispa*: the second method is that used by the more highly evolved *social* wasps, such as the paper-wasps. In these latter the worker caste

is developed and the cells are kept open, the young larva being fed by the workers with food such as masticated caterpillars, the cells being closed only after the larva is fully grown and ready to pupate.

It appears to me that there is a probability that *Abispa ephippium* might be included (contrary to the usual idea) among those Eumenids that exhibit this tendency towards the "social" method of feeding the young. The funnel entrance curving from the open cell would then have a further significance, in that it would form a definite check on parasites or other intruders that might enter the open cell during the absence of the female gathering provisions. However, only by careful and patient observation of *Abispa* during the actual processes of building and provisioning of the chambers, could this question be definitely settled, and my hope is that such an opportunity may come my way.

It was of great interest to find a paper by E. Roubaud, entitled "The Natural History of the Solitary Wasps of the Genus *Synagris*," in the annual report of the Smithsonian Institution for 1910. Here Roubaud gives a most interesting account of three species of this genus from the Congo, Africa, where a definite transition was seen from the solitary to the social mode of feeding. Thus, firstly, in *Synagris calida* the female provisions the cell, lays an egg, and closes the chamber, taking no further care of her offspring; secondly, in the case of *S. siceliana*, an egg is laid in the empty cell, and caterpillars are provided from day to day until the wasp larva is about three-quarters grown, when some surplus caterpillars are stored and the cell is closed; thirdly, in *S. cornuta*, the female guards and feeds her offspring from the time of hatching, until it is full-grown and ready to pupate, feeding it, not with whole caterpillars, but with masticated food, in exactly the manner of the true social wasps.

#### MAGPIES AS MIMICS

I have no doubt now that vocal mimicry is quite common among Black-backed Magpies. In the vicinity of Tallangatta I saw frequently two wild Black-backs that could mimic most of the sounds that I used to hear from a bird of the same kind at Eskdale—and that Magpie used to mimic the bark of the dog fox, the neigh of the horse, the whistling call of the swamp-harrier, and the calls of the mud-lark, grey thrush, and many smaller birds. I have also found two more mimicking Magpies in the Mitta district. I wonder if the White-backed Magpie is a mimic, too?—KATHLEEN CONWAY, Eskdale.

#### INTERESTING BOTANICAL FIND

At Rushworth (north-eastern Victoria), Mrs. Edith Rich, the finder of quite a number of interesting plant forms (including *Calochilus imberbis*, and purple-marked forms of *Diuris maculata*), has now discovered attractive pink flowers of *Cheiranthus linearis*, the "Finger-flower." This beautiful plant, which normally bears dark blue flowers, would doubtless be an acquisition to our rock-garden subjects.—W.H.N.